Waste Management Practice as the Local Environmental Security Issue

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Executive Summary

This paper presents innovative approach in recognizing the difference between Environmental Risk and Environmental Security.

Traditionally environmental security is focused on: (a) Prevention of environment-related conflicts, (b) Satisfaction of the military requirements related to environmental hazards which pose a threat to armed forces and (c) Remediation of damage to the environment caused by military operations. There are a wide range of environmental pressures with significant impacts on human health and on economic development. These environmental pressures include unsustainable / inappropriate disposal or treatment of waste.

Based on previous investigations, this paper is analyzing results of ongoing OSCE supported research on local security. The focus is on the security of communities, and of civil society in the target region (South Eastern Serbia), from acute social tension caused by waste practice factors, or to which environmental factors are a significant contributor. Applied methodology could be used in assessment of any other local community and region, in order to identify the level of citizens (un)security due to the waste management practice. Through this paper the authors open a discussion on effective and harmonized steps towards local environmental security and sustainable waste management and governance in transition countries.

Introduction

Republic of Serbia is located in southeastern Europe in the heart of the Balkan Peninsula. The sub region of Western Balkan is vulnerable to conflicts (Mihajlov, A., 2008; State of Human Security in Republic of Serbia, 2007; Macura A. et al., 2008).

Serbia's large and heavy industries are primarily linked with mining. Consequently, there was a considerable development of industries such as melting, refining, metallurgical industries, chemical industries, machinery and vehicle production. Other important industrial production include cement and other building materials, fertilizers, electrical equipment, sawmills, wooden furniture, paper products, leather and fur products, yarns and fabrics, rubber, textiles, food products and beverages. The economy of the Republic of Serbia has showed positive results since 2000. GDP rose by 5.7% in 2001, 3.3 % in 2002, 1.5% in 2003, and 7,1% in 2007 in real terms. It is estimated that in 2008 is around 6,1% . Only about 0,3% of GDP is allocated for environmental sector (Draft NEAP, 2005).

Waste Management Practice in Serbia

The general state of waste management in Serbia is inadequate (SNWMS, 2003) and it poses public health and environmental hazards. The most acute problem regards hazardous waste, which is not separately collected and dumped without processing on regular waste dumps. Waste volume in the Republic of Serbia (as in numerous transitional countries) is hard to estimate. The main reason is a lack of information on waste qualitative and quantitative analysis, i.e. data base of quantities, characteristics, especially content, and classification of waste. Average person generates approximately 318 kg of waste per annum or 0,87 per day. Households generate the majority of municipal waste (about 63 %), and 20 % is generated by businesses.

Poor waste management practice has huge environmental impact:

- Pollution of surface and groundwater and soil by leachate
- Air pollution caused by uncontrolled burning of dumpsites and gas emissions
- Emission of methane contributing to greenhouse effect
- Landscape degradation by improper waste disposal
- Contamination of soil and water by improper handling of special waste streams (waste oils, end of life vehicles, electronic waste, battery and accumulators, asbestos, TL tubes, etc).

Main conclusions on waste management in Serbia are as follows:

- There is lack of data base on volume, composition and waste streams
- Organized communal solid waste collection covers about 60-70 % population
- Rural areas are only partly covered by organized waste collection;
- Sole method of communal waste treatment is depositing to landfill sites (180 officially registered sites) which are not technically equipped and not in correlation with EU requirements and standards ;
- Limited capacity for processing of recyclable materials
- Lack of management system for separate waste streams (batteries and accumulators, waste oil, PCB, electronic and electric waste, end of life vehicles, waste tires, etc)
- Lack of separate plants for storage, treatment and disposal of hazardous waste
- Hazardous waste problem is critical, complex, requiring an integral approach in all phases, from the moment of its generation, through collection, transport, treatment, to disposal.
- There are neither facilities for hazardous waste treatment and disposal (destruction or incineration), nor proper storage facilities for hazardous waste.

Hazardous waste is disposed temporarily in inadequate storages (some of which exist for several decades).

- Although primary recycling is prescribed by law in Serbia, providing segregation of paper, glass and metal packaging in specially marked containers, recycling is not functioning in practice. (exception is the waste sorting facility in Novi Sad and some recycling yards). The industrial processing capacity for recyclables and recovered materials is very limited
- Communal solid waste collection taxes do not cover all expenses of waste collection and disposal;
- There is Insufficient inspection control and policy of penalties
- Lack of permitting system for collection, transport, treatment and disposal of solid waste
- Depreciated charges for collection and disposal of communal waste,
- Inefficient public utilities
- Low level of public awareness regarding waste management

Environmental Security Concept: Differences between Environmental Risk and Environmental Security

During the 1980's, two-way connection between security and the environment was observed.

SECURITY ⟺ ENVIRONMENT

Traditionally environmental security is focused on: (a) Prevention of environment-related conflicts, (b) Satisfaction of the military requirements related to environmental hazards which pose a threat to armed forces and (c) Remediation of damage to the environment caused by military operations. There are a wide range of environmental pressures with significant impacts on human health and on economic development.

In the context of local environmental security it should be underlined that (Mihajlov A., 2009a, 2009b):

1. environmental risk has one component:

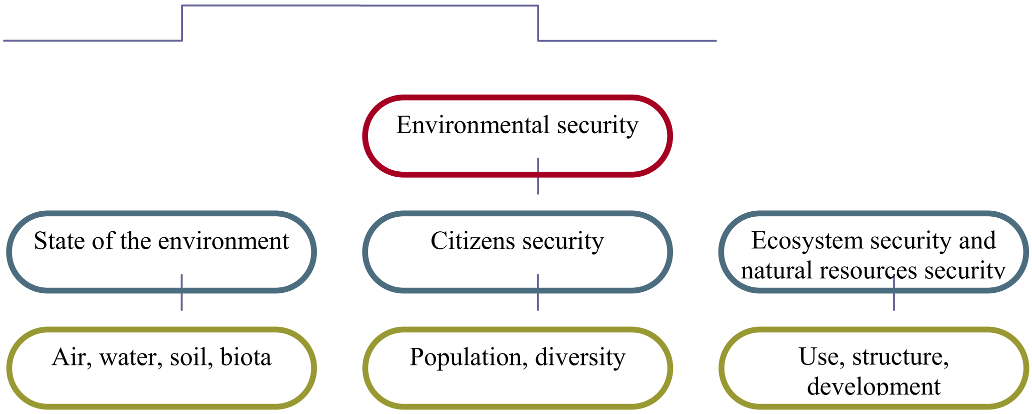
objective evaluation of the level of the risk

2. environmental security has two components:

objective evaluation of the level of the risk
subjective perception of the fear and concern that particular value we care about could be attacked and maybe lost

This paper presents innovative approach in recognizing the difference between Environmental Risk and Environmental Security.

Adopted methodology for determination local environmental security can be presented as follows:



Evaluation of environmental security means that both risk and its subjective perception must be evaluated, taking into consideration the fact that environmental issues are among crucial needs and values for human beings because they provide basis for quality of life.

This project is focused to determination of Local Environmental (un)Security in the seven municipalities on the south of Serbia. Main goal of the project was to examine the connection and correlation between subjective and objective perception of environmental insecurity of citizens.

Project process was organized (“ bottom-up” approach) as follows:

- in each of municipality was establish working group with local coordinator
- external coordinator are nominated from the Project
- working group were responsible for drafting questionnaires, identification of problems and collected data

Predominant problems of local environmental (in)security identified during preliminary and initial workshops in selected municipalities of southern Serbia (Medvedja, Vranje, Leskovac, Pirot, Bujanovac, Prijepolje and Prokuplje) are identified as:

1. waste
2. industrial pollution
3. energy supplying
4. municipality's planning documents
5. depleted uranium and environmental consequences of 1999's NATO bombing
6. municipality's services
7. implementation of legal acts
8. human capacities
9. awareness of citizens

Innovative Methodology for Determination of Priorities in the Field of Local Environmental Security

Based on previous investigations, this paper is analyzing results of ongoing OSCE supported research on local security. The focus is on the security of communities, and of civil society in the target region (South Eastern Serbia), from acute social tension caused by waste practice factors, or to which environmental factors are a significant contributor.

Data on subjective perception of environmental security were gathered by analyzing answers given in the questionnaire which had been previously prepared and distributed in chosen municipalities. It was recommended that every municipality should fit the questionnaire according to situation and environmental security indicators within the municipality, that the questionnaire could be sent by the post, filled by "door to door" interviews or by organizing the special meetings in order to distribute it to participants.

Data on objective environmental security (environmental risk) were gathered:

1. based on police data on environmental accidents in the municipality
2. based on municipality and/or court data on environmental related legal actions
3. based on available documents from environmental inspectorate both on the level of municipality and the state
4. based on the data regarding industrial pollution within the municipality
5. by recording overall economical situation in the municipality
6. by recording adopted municipality's strategies and evaluation of the effects of its implementation
7. by recording health consequences caused by the environment
8. by recording positive examples of environmental problems solving within the municipality, etc.

Possible choice of indicators is based on concept model UNEP-OECD: pressure-condition-response (PCR), but it is underlined that local coordinators were suggested to fit the choice of indicators according to environmental conditions in the particular municipality:

P	Pressure: human activities (industry, agriculture, traffic, etc.)
C	Condition of the environment: air, water, soil, flora & fauna, etc.
R	Response: institutions, governance, population, business, etc.

Wide accepted *method of visualization and analysis of data* is that environmental threats and fears should be mapped in digital (or other) form of space (maps of the locations). Considering the fact that all fears can not be mapped, it was necessary to define ultimate environmental insecurities based on accepted way of classification, mostly by grading them as "serious threat", "moderate threat", "low threat". In the next phase grades for every threat on the map of municipality were intersected and by that "focus points of local environmental security" were identified. Focus points identified according to this methodology confirmed that, by the ending of conflicts i.e. improving of environment, people do not automatically have the feeling of being secure in their environment.

Results based on data collected in four of seven municipalities and presented in full in Project Document, show that:

- there is significant correlation between subjective perception and objective state of environmental insecurity of citizens.

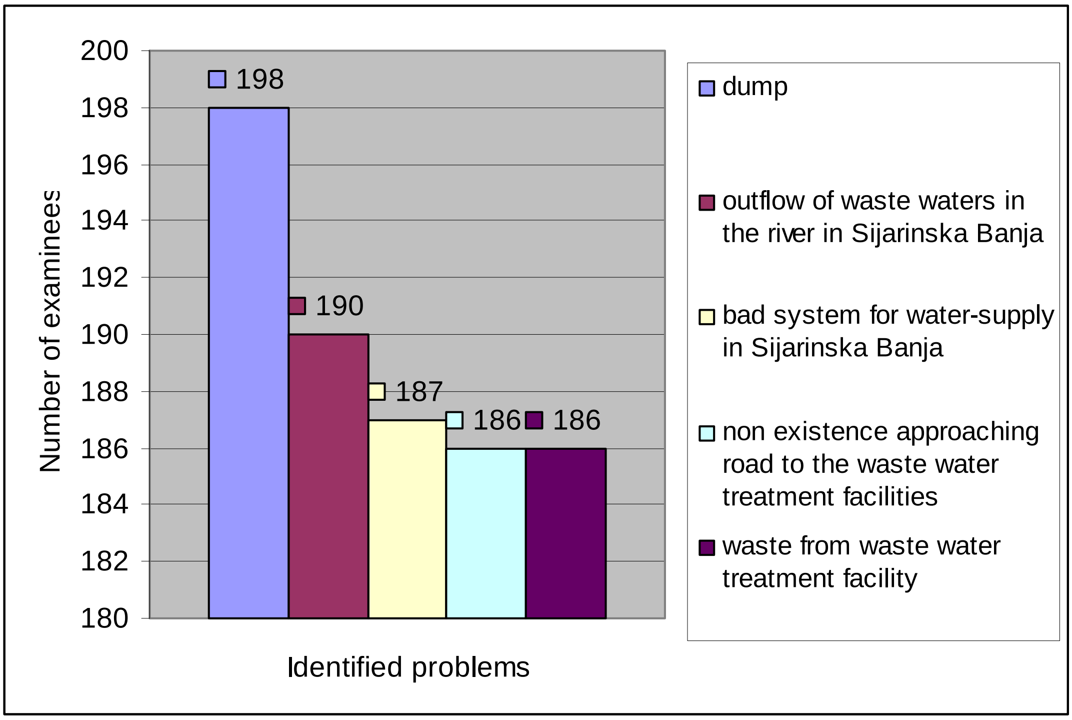
Non adequate waste management as well as non existence of sanitary landfilling are identified as the highest environmental risk in 4 municipalities and represent of environmental risk and objective state .

Case study: Municipality Medvedja

Municipality of Medvedja is located on the south of Serbia and belongs to the group of the most undeveloped municipalities in the whole Republic, characterized by low level of economical, social and communal infrastructure development. All industrial capacities, which were the bearers of the municipality's development, are now in very bad condition and mostly closed.

For the purpose of subjective evaluation of local environmental security, in the municipality of Medvedja 252 citizens were filled the distributed questionnaires. Graph 1 shows what are the most important problems which, according to the citizens' opinion, represent the highest environmental risk in the municipality.

Graph 1: The most important environmental problems identified by the citizens of Medvedja



Based on the analysis of the municipality's documents, identified problems representing the highest environmental risk in Medvedja are:

1. Dumping site – water pipeline under the dumping site,
2. Approaching road to the waste water treatment facilities,
3. Water supplying of Sijarinska Banja,
4. Issue of sewerage in Sijarinska Banja is not solved – sewerage water goes directly in the river,
5. Waste made by activity of waste water treatment facility.

Based both on the subjective and objective evaluation of local environmental security, the biggest problem in Medvedja is “Predgradje” dumping site. It is located between Jablanica river, M-9 main road, and private owned parcels. Size of this dumping site is around 30 a, there is no fence around it so uncontrolled access is possible. Thickness of the waste layer is from 0,5 m to 2,0 m. Dumping site is located nearby the river Jablanica, which floods this location twice to three times per year, taking certain amount of waste downstream.

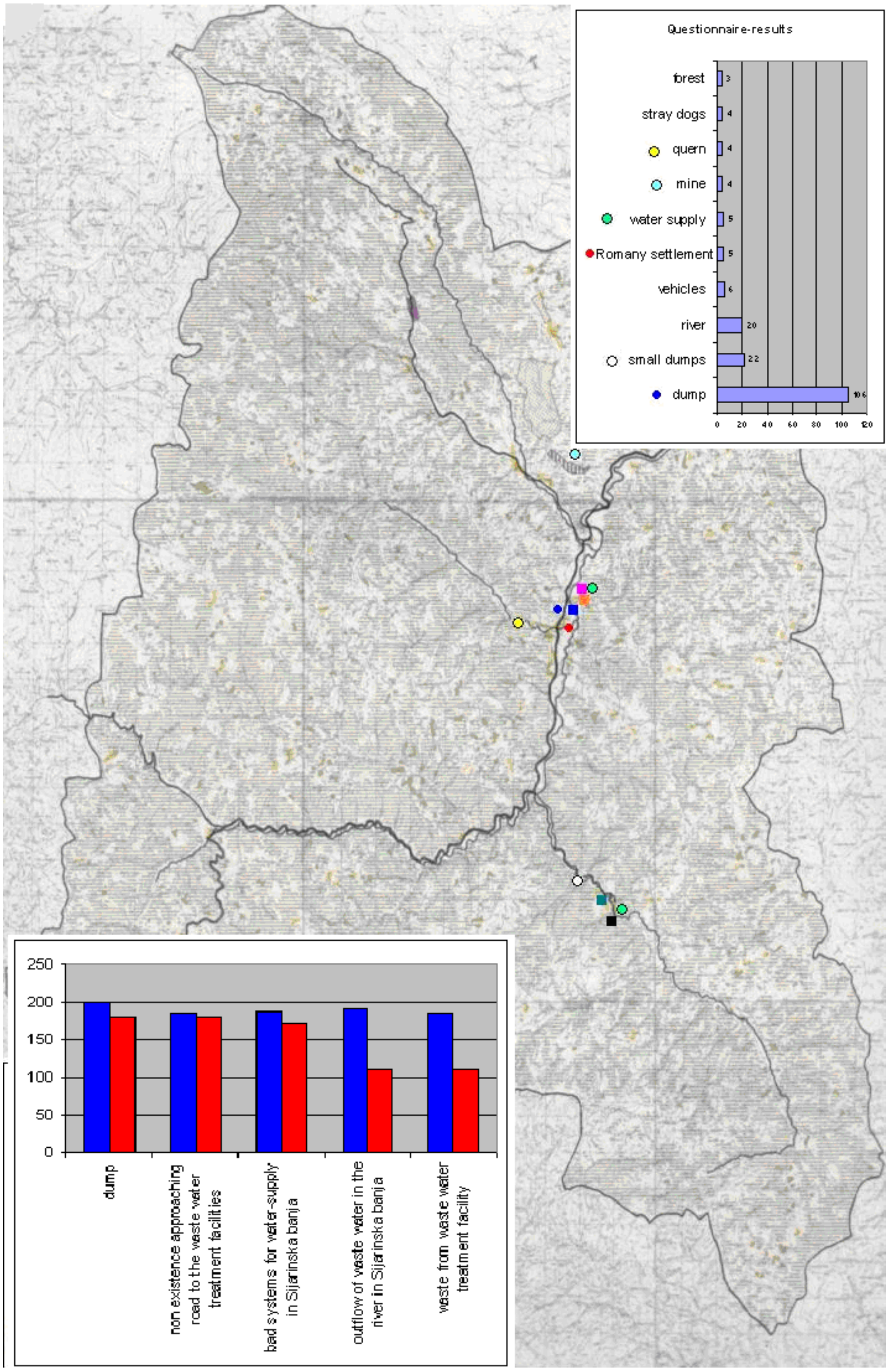
On the dumping site there are no infrastructure objects. Waste treatment doesn’t fulfill even the minimal criteria and norms prescribe by the law, so the dumping site could be considered as irregular and unmanaged. There is no plan for waste disposal, and except the communal waste generated in households some kinds of dangerous waste are also disposed there, such as packaging of chemical products and pesticides, used car batteries etc. The most important characteristic of this dumping site is that there is no possibility to define the amount of the waste because of very frequent floods of Jablanica river.

On the territory of Medvedja municipality there is no other way of waste treatment and disposal except using this dumping site. Possibilities for changing of present situation are very modest. One of the suggested conceptions is to establish waste transfer station in Medvedja, comprehended Medvedja and villages around it. From that transfer station selected waste should be transported to regional landfill in Leskovac. It should be underlined that Municipality of Medvedja signed the Agreement on construction and waste dumping on the regional Landfill.

Suggested strategies for solving the mentioned problems are presented in the Table 1:

Identified problem	*Suggested solving strategy*
Dumping site – water pipeline under the dumping site	Relocation of the dumping site – followed by sanitation and remediation of the site. Regional waste management plan stipulates removal of the present dumping site and transporting of the waste to regional landfill in Leskovac.
Approaching road to the waste water treatment facilities	There is no adequate approaching road to the waste water treatment facilities. Solution is in revitalization of the existing inadequate macadam path, with solving of property issues as a precondition.
Outflow of sewerage waters in the river in Sijarinska Banja	Construction of sewerage pipeline from Sijarinska Banja to Coktanci village, from where there is a pipeline connection to waste water treatment facilities.
Water supplying of Sijarinska Banja	Construction of new water pipeline from Medvedja to Sijarinska Banja based on existing capacities of Medvedja’s supplying, in order to fulfill the needs of both Medvedja and Sijarinska Banja.
Waste made by activity	It is necessary to provide technology and equipment for further processing of

of waste water treatment facility	the solid waste made by facility's activity in order to entail it to the level of natural fertilizer – mold.


Questionnaire-results
forest 3
stray dogs 4
quern 4
mine 4
water supply 5
Romany settlement 5
vehicles 6
river 20
small dumps 22
dump 106
0 20 40 60 80 100 120
250
200
150
100
50
0
dump
non existence approaching road to the waste water treatment facilities
bad systems for water-supply in Sijarinska banja
outflow of waste water in the river in Sijarinska banja
waste from waste water treatment facility

Picture 1- Data on Local Environmental Security for Municipality of Medvedja

As refer to collected data, it is concluded that :

- Waste management in municipality of Medvedja is not appropriate and present real threat and pressure for environment and health of citizens (data collected from real documents and terrain investigation)
- Waste management is prioritized as environmental problem (data collected form questionnaires)
- Waste management present threat to environmental security (data collected form questionnaires)
- Citizens have right to comply and feel environmental insecure with great reason related to environmental problems identified (data collected from real documents and terrain investigation)
- Collected data show correlation between subjective and objective perceptions of citizens , as it is presented at map of municipality of Medveđa . (data collected from real documents and terrain investigation as well as through questionnaires)

It is presented very strong correlation (Picture 1) between data collected from:
- the questionnaires as subjective perceptions (blue bar graph on the map)
- and objective situation (red bar graph).investigated at the field research

Concluded remarks

Human security puts the individual, its environment and livelihood at the centre of debate, analysis and policy. Ssafeguarding it, requires a new approach and a better understanding of many interrelated variables – social, political, economic, technological and environmental factors that determine the impacts on human security. Human security refers to the quality of life of the people. Anything which degrades their quality of life like demographic pressures, diminished access to or stock or resources, environmental issues etc. present a security threat conversely, anything which can upgrade their quality of life – economic growth, improved access to resources, social and political empowerment, etc is an enhancement of human security.

Environmental security can be achieved through better governance that includes community participation and public action. In this context, awareness creation and education have to be highlighted

Applied methodology for determination of local environmental security presented in this paper , could be used in assessment of any other local community and region, in order to identify the level of citizens (un)security due to the waste management practice, as well as due the other pressures.

Through this paper the authors open a discussion on effective and harmonized steps towards local environmental security and sustainable waste management and governance in transition countries.

Acknowledgements

These paper is based on results obtained by OSCE supported project "Local environmental security" (www.osce.org), and implemented by “Environmental Ambassadors” (www.ambassadors-env.org) in 2009. Project is acknowledged by Serbian

Ministry of Environment and Spatial Planning. The authors of this paper are involved in this project as the local experts (senior and junior), and thanks above mentioned organizations for opportunity to present this project to scientific arena.

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